ANALYTICAL RESULTS
OF SURFACE WATER SAMPLES
COLLECTED FROM RACCOON CREEK
October 20, 1999 Sampling Event

Prepared for:

LYONDELL CHEMICAL WORLDWIDE, INC./BEAZER EAST INC.

Prepared by:

Applied Hydrology Associates, Inc.
Pittsburgh, Pennsylvania
Denver, Colorado

November 10, 1999

Applied
Hydrology
Associates, Inc.

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1.0 INTRODUCTION

This report presents the results of surface water samples collected from Raccoon Creek at the Lyondell Chemical Worldwide, Inc. / Beazer East Inc. Monaca, PA site during the October 20, 1999 quarterly monitoring event. The samples were collected in compliance with Appendix D of the 1997 Consent Order and Agreement (1997 CO&A) between ARCO Chemical Company[1], BEI and the Pennsylvania Department of Environmental Protection (PADEP) dated October 20, 1997.

2.0 SAMPLING

Surface water samples were collected at Transect E as defined in the 1997 CO&A. The location of Transect E is shown in Figure 1. In addition, water elevations were measured in nearby monitoring wells and the results are presented in Appendix A.

A total of eight surface water samples, including a duplicate, were collected from Raccoon Creek on October 20, 1999. These samples were collected at the same three locations along Transect E as in previous sampling events. The locations are shown in Figure 2 and are at the center of the stream, and approximately 30 feet from the east and west banks. At the center location, samples were collected at three depths; 6 inches below the surface, 2 inches above the bottom, and midway between the surface and bottom. Samples from the east and west sides of the transect were collected at two depths; 2 inches above the bottom, and midway between the surface and bottom.

During sampling a boat was stationed at Transect E using a rope secured to the east and west shores of Raccoon Creek. The samples were collected by using a peristaltic pump to pump water from the desired depth into three 40-ml vials preserved with hydrochloric acid. Samples were collected from the required depths utilizing tubing secured to a vertical steel rod lowered from the boat until it rested on the bottom of the creek. The rod did not penetrate the sediments on the creek bottom because a 1-foot diameter disc constructed of steel mesh is fastened perpendicular to the bottom of the rod.

Two tubes were used. The bottom of the "deep sample tube" was secured to the probe 2 inches from the bottom of the probe. The bottom of the "mid-depth sample tube" is adjustable and was secured to the probe mid-depth at each location. Care was taken not to disturb the sediments at the sampling location and the pumped water was closely monitored to ensure sediment was not included in the sample. One gallon of water was pumped through the tubing before each sample was obtained in order to purge the tubing.

[1] ARCO Chemical Company is now Lyondell Chemical Worldwide

The samples were uniquely numbered as follows to identify the location, depth and date of sampling:

RC-EC-00-1099

Where:

RC	indicates Raccoon Creek
EC	indicates Transect E and location (C=Center, L = Left bank, R = Right bank [facing downstream])
00	indicates sample depth in feet and tenths of a foot (0.0 feet)
1099	indicates the month and year collected (October 1999)

Samples were logged onto a chain of custody form (included in of the Analytical Report in Appendix B) and stored on ice until receipt by Reliance Laboratories Inc. in Edison, NJ. Reliance analyzed the samples using USEPA Method 524.2 for BTEXS.

3.0 RESULTS

The analytical results are presented in Table 1. Benzene was detected in six of the seven locations and concentrations in samples where benzene was detected ranged from 0.18 µg/L in Sample RC-EL-00-1099[2] to 0.43 µg/L in sample RC-EC-00-1099. Sampling locations and depths are shown on Figure 2, along with the concentration of benzene at each location. Water levels in wells near Raccoon Creek are presented in Appendix A.

Table 1
Summary of Analytical Results for Samples Collected from Raccoon Creek

Sample Name	Benzene	Toluene	Ethylbenzene	Xylene	Styrene
RC-EL-00-1099	0.14	0.60	<0.22	0.60	< 0.58
RC-EL-00-1099A	0.21	1.26	0.25	1.16	< 0.58
RC-EL-19-1099	0.27	1.32	0.28	1.4	< 0.58
RC-EC-00-1099	0.43	2.49	0.48	3.11	< 0.58
RC-EC-33-1099	0.42	2.18	0.43	2.54	< 0.58
RC-EC-69-1099	0.20	0.6	<0.22	0.67	< 0.58
RC-ER-00-1099	0.23	1.03	<0.22	1.05	< 0.58
RC-ER-65-1099	<0.13	<0.6	<0.22	0.47	< 0.58

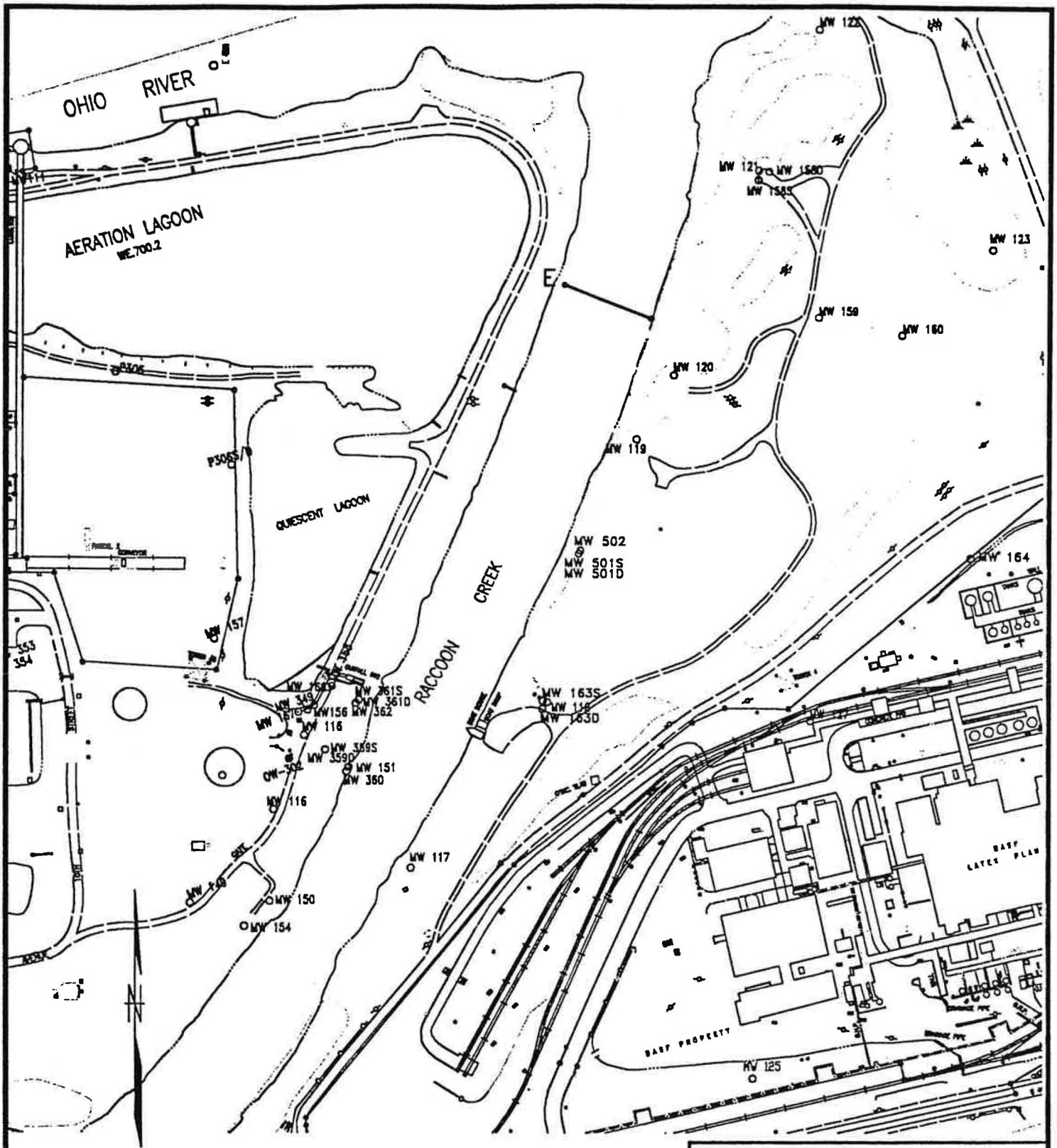
The analytical data were validated upon receipt and found to be acceptable. A Data Validation Report is provided in Appendix B. Table 2 presents the historical concentration of benzene in Raccoon Creek at Transect E during all monitoring events to date.

[2] The benzene concentration of 0.18 ug/L is the average of the concentration in the two duplicates samples, RC-EL-00-1099 and RC-EL-00-1099A.

Historic Benzene Concentrations at Transect E
(ug/L)

Sampling Location	Sampling Depth	7/23/97	10/28/97	2/25/98	5/21/98	7/29/98	10/27/98	2/3/99	4/27/99	7/22/99	10/20/99
30 Feet off West Bank	Mid-depth	0.28	<0.13	<0.13	0.70	<0.13	1.57(1)	0.37	< 0.66	<0.13	0.18(1)
30 Feet off West Bank	Deep	0.81	<0.13	<0.13	0.70	<0.13	0.61(1)	0.49	< 0.66	<0.13	0.27
Center of Creek	Shallow	0.24	<0.13	0.38	0.70	<0.13	<0.13	0.61(1)	< 0.66(1)	<0.13(1)	0.43
Center of Creek	Mid-Depth	0.18	<0.13	0.49	0.64	<0.13	0.2	0.64	< 0.66	<0.13	0.42
Center of Creek	Deep	0.46	<0.13	0.30	0.60	<0.13	<0.13	0.69	< 0.66	<0.13	0.20
30 Feet off East Bank	Mid-depth	0.16	<0.13	<0.13	<0.13	0.13	0.52	< 0.13	< 0.66	<0.13	0.23
30 Feet off East Bank	Deep	<0.13	<0.13	0.14	0.22	0.22	<0.13	< 0.13	< 0.66	<0.13	<0.13

(1) Results shown are the average of the blind duplicate samples.

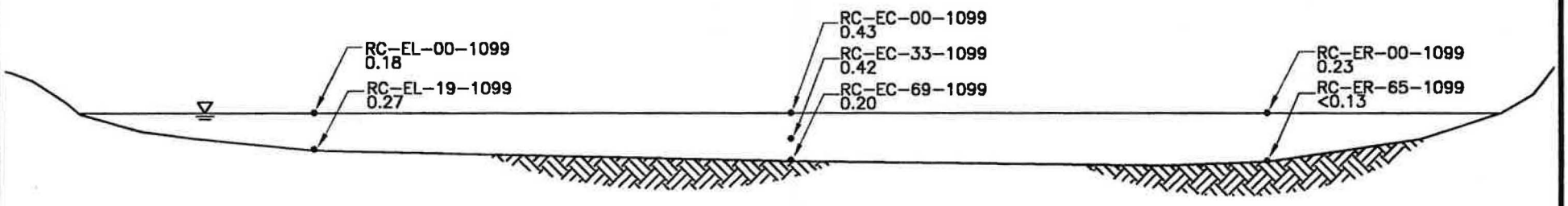


Applied Hydrology Associates, Inc.

ARCO CHEMICAL COMPANY
BEAVER VALLEY PROPERTY
RACCOON CREEK QUARTERLY MONITORING

FIGURE 1 TRANSECT AND MONITORING WELL LOCATIONS

DESIGN SM	DATE 8/27/98	FILE REFERENCE TRANSECT.DWG
DRAWN MJZ	SCALE	
CHECKED	APPROVED	PROJECT NO. 38-5



CREEK SECTION
LOOKING DOWNSTREAM

LEGEND

- SURFACE WATER SAMPLE LOCATION

ALL CONCENTRATIONS IN ug/L

20' 0 20'

SCALE IN FEET

Applied Hydrology Associates, Inc.

LYONDELL CHEMICAL WORLDWIDE
BEAVER VALLEY PROPERTY
RACCOON CREEK QUARTERLY MONITORING

FIGURE 2

SURFACE WATER BENZENE CONCENTRATIONS AT TRANSECT "E"

OCTOBER 20, 1999

DESIGN: SM	DATE: 8/17/99	FILE REFERENCE: BENZENE.dwg	
DRAWN: JLS	SCALE: NOT TO SCALE		
CHECKED:	APPROVED:	PROJECT NO.: 38-5	PAGE NO.:

Appendix A

Groundwater Elevations, East and West Sides of Raccoon Creek

GROUNDWATER LEVELS ON THE EAST AND WEST SIDES OF RACCOON CREEK
OCTOBER 20, 1999

Well Number	Top of Casing (TOC) (ft. amsl)	Depth to SPL from TOC (2) (ft. amsl)	Depth to Water from TOC (2) (ft. amsl)	Calculated Water Level Elevation (1) (ft. amsl)	Calculated SPL Thickness (3) (ft. amsl)	Comments
Monitoring Wells Screened in Silty Clay Unit						
OTH AREA						
MW - 360	685.84	ND	3.12	682.72	N/A	
MW - 170	706.70	ND	22.44	684.26	N/A	
MW - 362	689.43	ND	6.29	683.14	N/A	
RACCOON CREEK AREA						
MW- 118	690.39	ND	7.06	683.33	N/A	Monitoring well is dry. Screened above water table. Bottem of well is 7.06 feet below TOC.
MW - 502	701.86	ND	19.08	682.78	N/A	
MW - 119	705.59	ND	22.77	682.82	N/A	
MW - 120	709.42	ND	26.50	682.92	N/A	
MW - 121	713.90	ND	30.91	682.99	N/A	
MW - 152	696.35	ND	13.80	682.55	N/A	
Monitoring Wells Screened in Upper Sand and Gravel Unit						
OTH AREA						
MW - 344	709.42	ND	24.89	684.53	N/A	
MW - 359S	692.93	ND	9.50	683.43	N/A	
MW - 361S	689.40	ND	6.23	683.17	N/A	
MW - 169	707.93	ND	25.35	682.58	N/A	Well had excessive pressure build up from OTH Sprage event (7/13/99 - 7/14/99).
MW - 167	711.06	ND	28.00	683.06	N/A	Top of casing changed from 707.36 to 711.06 on 11/98 to accommodate respiration monitoring well head. Monitoring well stick up is 3.70 above orig. TOC
RACCOON CREEK AREA						
MW - 163S	690.87	ND	7.81	683.06	N/A	
MW - 501S	701.30	ND	18.72	682.58	N/A	
MW - 162S	706.05	ND	23.22	682.83	N/A	
MW - 159	708.99	ND	25.99	683.00	N/A	
MW - 160	701.00	ND	18.01	682.99	N/A	
MW - 158S	713.60	ND	30.62	682.98	N/A	
MW - 122	692.78	ND	9.81	682.97	N/A	
Note: See figure 1						
(1) Calculated values, based on Elevation of TOC minus Depth to Water from TOC.						
(2) Measured from top of casing using the MMA Interface Probe. ND means no SPL was detected.						
(3) Calculated values, based on Depth to Water from TOC minus Depth to SPL from TOC. N/A means not applicable, no SPL was detected.						

GROUNDWATER LEVELS ON THE EAST AND WEST SIDES OF RACCOON CREEK
OCTOBER 20, 1999

Well Number	Top of Casing (TOC) (ft. amsl)	Depth to SPL from TOC (2) (ft. amsl)	Depth to Water from TOC (2) (ft. amsl)	Calculated Water Level Elevation (1) (ft. amsl)	Calculated SPL Thickness (3) (ft. amsl)	Comments
Monitoring Wells Screened in Lower Sand and Gravel Unit						
OTH AREA						
MW 345	708.91	ND	25.84	683.07	N/A	
MW 361D	689.35	ND	6.30	683.05	N/A	
MW 359D	692.80	ND	9.70	683.10	N/A	
RACCOON CREEK AREA						
MW 163D	689.62	ND	6.54	683.08	N/A	
MW 501D	701.44	ND	18.50	682.94	N/A	
MW 166D	703.95	ND	20.98	682.97	N/A	
MW 158D	712.04	ND	29.16	682.88	N/A	
Water Levels in Raccoon Creek and Ohio River						
RACCOON CREEK AREA STAFF GAUGE						
Time of Observation	**Staff Gauge Elevation (ft. amsl) (4) (5)**	**Staff Gauge Reading**	**Calculated Water Level Elevation (ft. amsl)**	**Comments**		
10:33	685.00	0.70	682.70			
13:00	685.00	0.70	682.70			
OHIO RIVER. STAFF GAUGE						
9:46	685.96	2.75	682.71			
12:30	685.96	2.75	682.71			
Note: See figure 1						
(1) Calculated values, based on Elevation of TOC minus Depth to Water from TOC.						
(2) Measured from top of casing using the MMA Interface Probe. ND means no SPL was detected.						
(3) Calculated values, based on Depth to Water from TOC minus Depth to SPL from TOC. N/A means not applicable, no SPL was detected.						
(4) Elevation 685.00 is equivalent to 3.00 mark on staff gauge at Raccoon Creek						
(5) Elevation 685.96 is equivalent to 6.00 mark on staff gauge at Ohio River						

Appendix B

Data Validation Report

Applied Hydrology Associates, Inc.

1200 South Parker Road, Suite 100 Denver, CO 80231 Tel: (303) 873-0164 Fax: (303) 873-6110

M E M O R A N D U M

TO: **Files**
FROM: **Skip Meier, Applied Hydrology Associates**
DATE: **November 11, 1999**
SUBJECT: **Data Validation Results, Lyondell Chemical Worldwide Beaver Valley Property**

Data validation was performed on the volatile organic analytical data from eight surface water samples obtained from Raccoon Creek on October 20, 1999 and also on a Rinsate Blank and Trip Blank. The validation was performed in accordance with the "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review". Reliance Laboratories Inc. performed the analysis using EPA Method 524.2. The samples reviewed included:

Field Sample ID	Lab Sample ID
RC-EL-00-1099	R-6204.4
RC-EL-00-1099A	R-6204.8
RC-EL-19-1099	R-6204.3
RC-EC-00-1099	R-6204.7
RC-EC-33-1099	R-6204.6
RC-EC-69-1099	R-6204.5
RC-ER-00-1099	R-6204.2
RC-ER-65-1099	R-6204.1
Rinsate Blank	R-6204.9
Trip Blank	R-6204.10

Items reviewed and actions taken were as follows:

√ **Method:**
The ten samples were analyzed for BTEXS by method USEPA 524.2 on October 21, 1999.

√ **Holding Time:**
All Samples were analyzed within the 14-day holding time.

√ **Blanks:**
No target compounds were detected in the associated method blank.

√ **System Monitoring Compounds:**
The "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" indicate that "Recoveries for system monitoring compounds in volatile samples and blanks must be within the limits specified in the Method." However, Method 524.2 does not specify a required recovery. Nevertheless, 4-

bromofluorobenzene and 1,2-dichlorobenzene-d4 surrogate recoveries were within 93-108 percent and this is acceptable.

√ **Internal Standards:**
All fluorobenzene internal standards were within the established criteria for area internal standard and retention time.

√ **GC/MS Instrument Performance Check:**
All bromofluorobenzene (BFB) tunes met the ion abundance criteria. Analysis of the instrument performance check solution was performed at the beginning of each 12-hr period during which the samples were analyzed.

√ **Initial Calibrations:**
The initial calibration performed on October 21, 1999 for Instrument HP5971A met the 30 percent relative standard deviation (RSD) and 0.05 minimum relative response factor criteria for all compounds.

√ **Continuing Calibrations:**
Continuing calibration was run and compared to the correct initial calibration. All continuing calibrations met the 25 percent difference and minimum relative response factor criteria for all compounds.

√ **Matrix Spike/Duplicate:**
The matrix spike/duplicate results for recovery and RPD were within the Quality Control limits.

√ **Target Compound Indentification/Quantitation:**
No problems were identified with compound identification or quantities.

√ **Field Duplicate:**
A field duplicate was collected during this sampling event. The duplicate sample was denoted by an "A" at the end of the sample name. The pair is RC-EL-00-1099 and duplicate RC-EL-00-1099A. Table 1 below summarizes the RPD for the sample/duplicate pair[1].

Table 1: Relative Percent Difference (RPD)

Sample Name	Benzene (ppb)	RPD (%)	Toluene (ppb)	RPD (%)	Ethyl-Benzene (ppb)	RPD (%)	Xylene (ppb)	RPD (%)	Styrene (ppb)	RPD (%)
RC-EL-00-1099	14	40	0.60	71	<0.22	NA	0.60	64	ND	NA
RC-EL-00-1099A	21		1.26		0.25		1.16		ND	NA

ND = Non Detect
NA = Not Applicable

√ **Summary:**
No inconsistencies were noted except that poor agreement was seen between the duplicate sample pair RC-EL-00-1099 and RC-EL-00-1099A. (See Table 1). No BTEXS compounds were detected in either the trip blank or the field blank.

[1] The equation for calculating RPD is: $RPD = 2 * \frac{|S - D|}{S + D} * 100$ where S = sample concentration and D = duplicate concentration

RELIANCE
LABORATORIES, INC.

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ANALYTICAL REPORT

For
Lyondell Chemical
Monaca, PA 15061

Project: Raccoon Creek

RELIANCE
LABORATORIES, INC.

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ANALYTICAL DATA REPORT

for

Lyondell Chemical
Monaca, PA 15061
Project: Raccoon Creek

Date Received: 10/21/99

Sample ID	Lab ID #
RC-ER-65-1099	R-6204.1
RC-EF-00-1099	R-6204.2
RC-EL-19-1099	R-6204.3
RC-EL-00-1099	R-6204.4
RC-EC-69-1099	R-6204.5
RC-EC-33-1099	R-6204.6
RC-EC-00-1099	R-6204.7
RC-EL-00-1099A	R-6204.8
Rinsate Blank	R-6204.9
Trip Blank	R-6204.10

These samples have been analyzed by EPA Method 524.2 for a selected compound list.
The results are not designed for use for drinking water purposes.

G. P. Kirpalani
Manager

GPK/vb

RELIANCE
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RELIANCE
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175 MAY STREET, EDISON, NJ 08837 PH (732) 738-5454 FAX (732) 738-5841
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LABORATORY CHRONICLE

Customer Name Lyondell Chemical
Date Received: 10/21/99
Date Sampled: 10/20/99
Sample ID: As per chain of custody

Organic Extraction:

1 Acids _____
2 Base / Neutrals _____
3 Pesticides/PCB's _____
4 TPHC _____

Analysis:

1 Volatiles 10/21/99
2 Acids _____
3 Base/Neutrals _____
4 Pesticides/PCB's _____
5 TPHC _____

Inorganics:

1 Metals _____
2 Cyanides _____
3 Phenols _____

Other Analysis:

_____
_____

Supervisor
Review & Approval _____

RELIANCE
LABORATORIES INC.

3090 WOODBRIDGE AVENUE, EDISON NJ 08837 PH (908) 738-5454 FAX (908) 738-5841

NON-CONFORMANCE SUMMARY

Reliance Labs received 8 water sample, 1 Rinsate Blank and 1 Trip blank for BTEXS by method (EPA 524.2) from Lyondell Chemical on 21 October 1999. Samples consisted of 10 vials.

Matrix spike recovery analysis was performed on samples and results are attached. 10mL of sample was used on spike/spike dup since not enough sample was provided

All analyses were performed within the required holding time.

4. Run Sequence

A. Tune Instrument

1. Inject 1µL of 25 ppm BFB into GC.
   a. Tune must pass against criteria.
   b. Tune must be run before any samples, blank or calibrations can be run.
   c. From time to tune 12 hours are available to run all QC data and samples.

B. Five Point Calibration Curve

1. Purge five (5) concentrations of standard solutions containing all the target analysis at 1 ppb, 2 ppb, 5 ppb, 10 ppb, and 20 ppb.
2. The above standard must be run within 12 hours of injecting the BFB tune.
3. Created a calibration curve with the above standard runs.
   a. If the 30% RSD deviation is exceeded the standards must be run again (still within 12 hours)
4. Create an identification file from this calibration curve for automated quantification.

C. If time remains in the 12-hour run period go to step F.

D. If the 12-hour period has expired, a new tune must be injected and a new sequence must be started.

E. Once an initial calibration curve is established a continuing calibrations check may be run. A continuing calibration check is required every time the mass spectrometer is tuned.

1. 2 ppb concentration of all target compounds is purged and quanted against current ID file.
2. Check the response factors of this run against the average RF of the calibration file. The RF of the continuing calibration must be within ± 50% D (difference) of the 5 point for all compounds.
3. The area counts of internal standard and surrogates must not be decreased by >30% from the most recent continuing calibration standard nor decrease by >50% from the initial calibration standard.

F. Daily Blank

1. Purge 20 ml of laboratory reagent water (nanopure) with 5 ppb internal standard and 5 ppb each surrogate.
2. Run this blank and quant against current ID file.
3. If blank does not meet criteria, it must be rerun before analyzing any samples.

G. Samples

1. Fill 25 ml syringe until it overflows with sample. Then adjust the volume to 20 ml exactly.
2. Inject 5 µl each 25 ppm internal standard and surrogate standard solution into each sample.
3. Run and quant against the current 5 point calibration curves.
4. Any sample with target compound over 50 ppb must be rerun at the appropriate dilution.
5. Any sample not injected in 12-hour period must be rerun.

H. Quality Control Sample (QCS)

1. Analyze a QCS from an external source at least quarterly.

STANDARD OPERATING PROCEDURE
METHOD 524.2

1. Scope

This is the general method for the procedure used to identify purgeable volatile organics in portable water. The sample is purged with ultra high purity helium and concentrated into a trap. The volatiles are then thermally desorbed onto a megabore column and identified using a mass spectrometer detector.

2. **Equipment and Apparatus**

A. Sample containers- 40ml screw caps amber vials.

B. Purge and Trap System.
   1. 25cm VOCARB 3000 trap.

C. Glassware
   1. 20 ml fritted purging vessels.
   2. 25 ml teflon sealed syringe with lever lock assembly.
   3. 10 µL syringes.

D. Gas Chromographic / Mass Spectrometer.
   1. Column type J&W
      75 m, 0.53 mm ID, DB624 3 microns

E. Apparatus Conditions
   1. Tekmar (purge and trap)

a.	Purge time	:	2 min.
b.	Desorb time and temp.	:	250° for 2 min.
c.	Bake time and temp.	:	260° for 12 min.
d.	Flow rate	:	15 cc/min.

   2. GC Conditions

a.	Column flow	15 cc/min.
b.	Initial temp.	35° C
c.	Ramping Rate	6° C/min.
d.	Final temp.	200° C
e.	Run time	47.25 min.
f.	Initial time	6 min.

3. **Stock Standards**

A. Internal Standard
   1. Flourobenzene

B. Surrogates
   1. 1,2-dichlorobenzene-d4
   2. 4-bromoflurobenzene

C. Prepare standard solutions for all target compounds and surrogates at 20 ppm.

D. Prepare internal standard at 20 ppm in methanol.
   1. Prepare all standards and store in teflon sealed 1 ml vials.

R E L I A N C E
LABORATORIES INC.

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EMAIL : 74201.3501@COMPUSERVE.COM

LABORATORY ID
NJ DEP NO. 12687
PA DER NO. 68437

CERTIFICATE OF ANALYSIS

Customer: Lyondell Chemical
Sample: Aqueous Samples
Date Sampled: 20 October 1999
Lab ID: R-6204
Reference: **AHA / Monaca**

22 October 1999

Units: µg/L

Sample ID	Benzene	Toluene	Ethylbenzene	Xylene	Styrene
RC-ER-65-1099	< 0.13	< 0.6	< 0.22	0.47	< 0.58
RC-ER-00-1099	0.23	1.03	< 0.22	1.25	< 0.58
RC-EL-19-1099	0.27	1.32	0.28	1.40	< 0.58
RC-EL-00-1099	0.14	0.60	< 0.22	0.60	< 0.58
RC-EC-69-1099	0.20	0.60	< 0.22	0.67	< 0.58
RC-EC-33-1099	0.42	2.18	0.43	2.54	< 0.58
RC-EC-00-1099	0.43	2.49	0.48	3.11	< 0.58
RC-EL-00-1099A	0.21	1.26	0.25	1.16	< 0.58
Rinsate Blank	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
Trip Blank	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58

G. P. Kirpalani
Manager

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6633.D
Acq On : 21 Oct 99 7:46 pm
Sample : R-6204.1
Misc : Lyondell - RC-ER-65-1099
Quant Time: Oct 22 11:27 1999

Vial: 3
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	12.49	96	506914	5.00	ug/L	-0.04
System Monitoring Compounds						%Recovery
43) 4-bromofluorobenzene	25.65	95	191281	5.02	ug/L	100.39%
55) 1,2-dichlorobenzene-d4	30.85	152	126071	5.13	ug/L	102.69%
Target Compounds						Qvalue
26) Toluene	17.39	91	59835	0.38	ug/L	92
36) m&p-xylenes	22.62	106	25484	0.21	ug/L	74
37) o-xylene	23.91	91	31975	0.26	ug/L	93

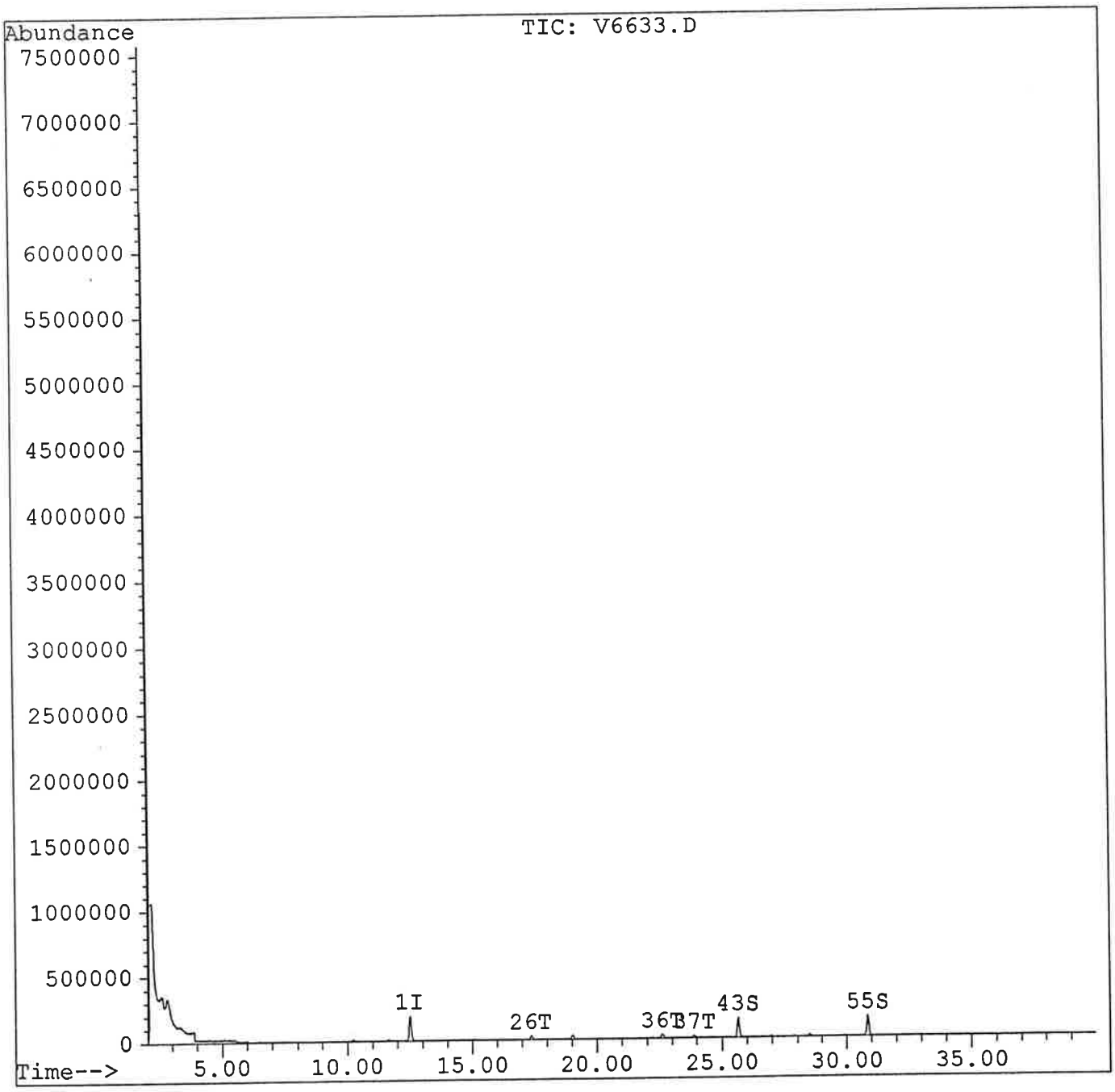
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6633.D
Acq On : 21 Oct 99 7:46 pm
Sample : R-6204.1
Misc : Lyondell - RC-ER-65-1099
Quant Time: Oct 22 11:27 1999

Vial: 3
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration



Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6627.D
Acq On : 21 Oct 99 3:08 pm
Sample : R-6204.2
Misc : Lyondell - RC-ER-00-1099
Quant Time: Oct 22 11:38 1999

Vial: 11
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	12.52	96	487047	5.00	ug/L	-0.01
System Monitoring Compounds						%Recovery
43) 4-bromofluorobenzene	25.67	95	188380	5.14	ug/L	102.90%
55) 1,2-dichlorobenzene-d4	30.88	152	127564	5.41	ug/L	108.14%
Target Compounds						Qvalue
19) Benzene	11.68	78	41247	0.23	ug/L	93
26) Toluene	17.41	91	156995	1.03	ug/L	99
35) Ethylbenzene	22.22	91	35940	0.21	ug/L	95
36) m&p-xylenes	22.65	106	65783	0.56	ug/L	96
37) o-xylene	23.91	91	82027	0.69	ug/L	94

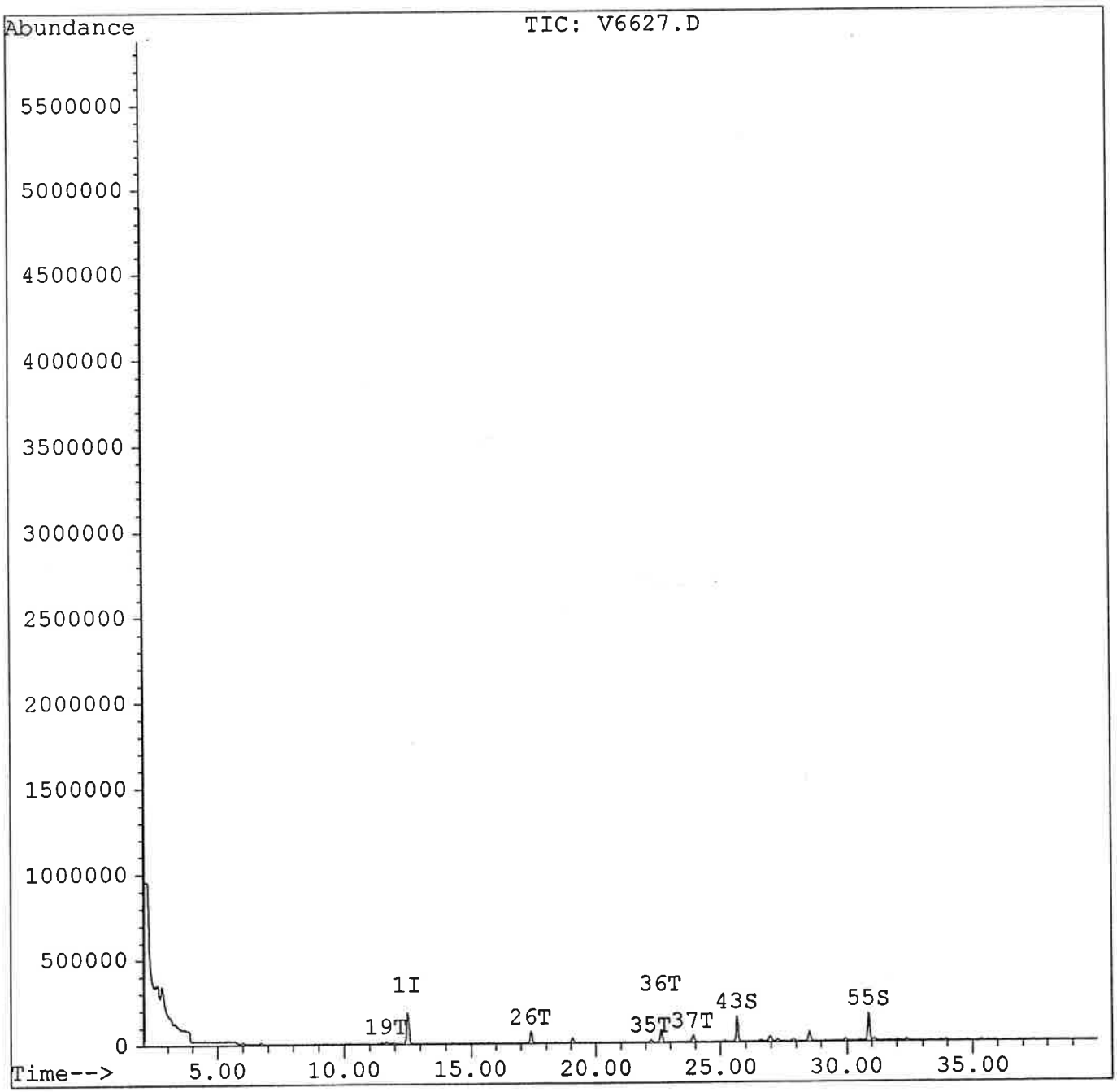
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6627.D
Acq On : 21 Oct 99 3:08 pm
Sample : R-6204.2
Misc : Lyondell - RC-ER-00-1099
Quant Time: Oct 22 11:38 1999

Vial: 11
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration



003

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6628.D
Acq On : 21 Oct 99 3:54 pm
Sample : R-6204.3
Misc : Lyondell - RC-EL-19-1099
Quant Time: Oct 22 11:36 1999

Vial: 12
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	12.52	96	473211	5.00	ug/L	0.00
System Monitoring Compounds						%Recovery
43) 4-bromofluorobenzene	25.68	95	173496	4.88	ug/L	97.54%
55) 1,2-dichlorobenzene-d4	30.88	152	114035	4.97	ug/L	99.50%
Target Compounds						Qvalue
19) Benzene	11.67	78	47696	0.27	ug/L	90
26) Toluene	17.40	91	196163	1.32	ug/L	97
35) Ethylbenzene	22.22	91	46104	0.28	ug/L	98
36) m&p-xylenes	22.64	106	70813	0.62	ug/L	99
37) o-xylene	23.92	91	89387	0.78	ug/L	99

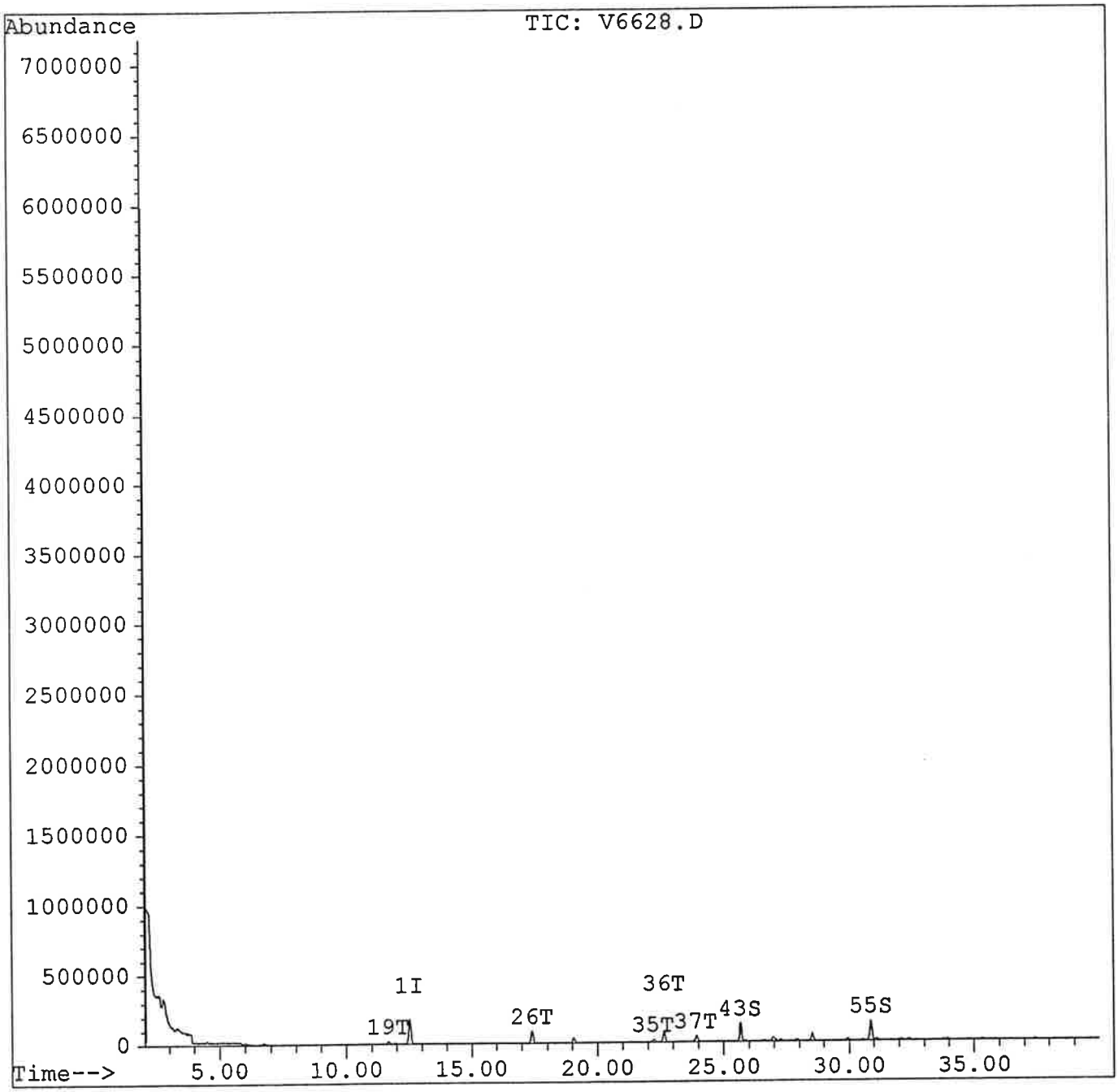
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6628.D
Acq On : 21 Oct 99 3:54 pm
Sample : R-6204.3
Misc : Lyondell - RC-EL-19-1099
Quant Time: Oct 22 11:36 1999

Vial: 12
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration



011

Data File : C:\HPCHEM\1\DATA\V6629.D
Acq On : 21 Oct 99 4:41 pm
Sample : R-6204.4
Misc : Lyondell - RC-EL-00-1099
Quant Time: Oct 22 11:35 1999

Vial: 13
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	12.52	96	524441	5.00	ug/L	0.00
System Monitoring Compounds						%Recovery
43) 4-bromofluorobenzene	25.66	95	198829	5.04	ug/L	100.86%
55) 1,2-dichlorobenzene-d4	30.88	152	133554	5.26	ug/L	105.15%
Target Compounds						Qvalue
19) Benzene	11.68	78	27151	0.14	ug/L	90
26) Toluene	17.40	91	99495	0.60	ug/L	98
35) Ethylbenzene	22.25	91	20370	0.11	ug/L	94
36) m&p-xylenes	22.64	106	30845	0.24	ug/L	96
37) o-xylene	23.93	91	46195	0.36	ug/L	97

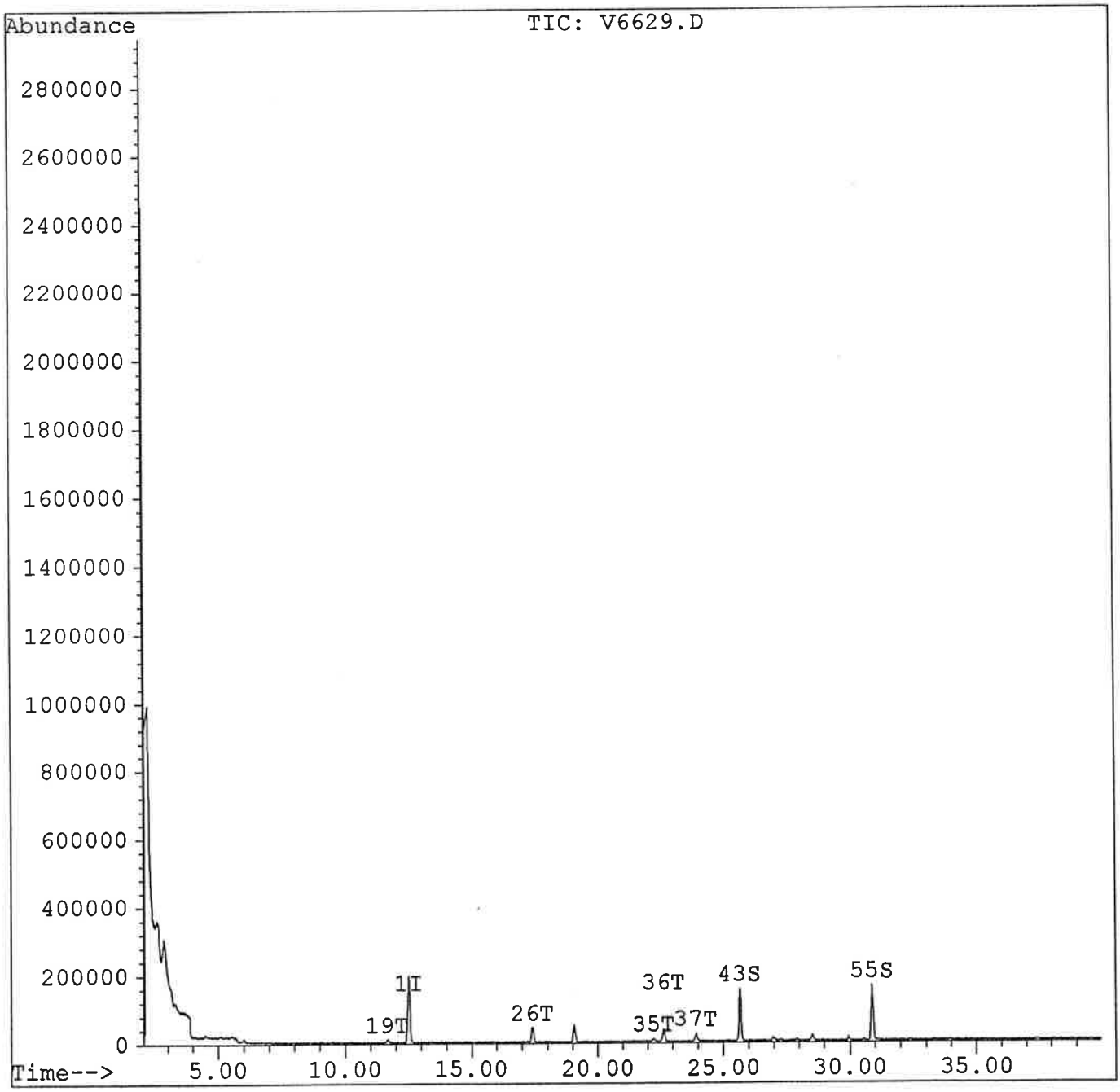
(#) = qualifier out of range (m) = manual integration
V6629.D RUN524.M Fri Oct 22 11:35:13 1999

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6629.D
Acq On : 21 Oct 99 4:41 pm
Sample : R-6204.4
Misc : Lyondell - RC-EL-00-1099
Quant Time: Oct 22 11:35 1999

Vial: 13
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration



Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6630.D
Acq On : 21 Oct 99 5:27 pm
Sample : R-6204.5
Misc : Lyondell - RC-EC-69-1099
Quant Time: Oct 22 11:33 1999

Vial: 14
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	12.53	96	499715	5.00	ug/L	0.00
System Monitoring Compounds						%Recovery
43) 4-bromofluorobenzene	25.67	95	191795	5.11	ug/L	102.11%
55) 1,2-dichlorobenzene-d4	30.88	152	128748	5.32	ug/L	106.38%
Target Compounds						Qvalue
19) Benzene	11.68	78	36335	0.20	ug/L	96
26) Toluene	17.40	91	94149	0.60	ug/L	98
36) m&p-xylenes	22.64	106	35481	0.29	ug/L	92
37) o-xylene	23.94	91	45874	0.38	ug/L	93

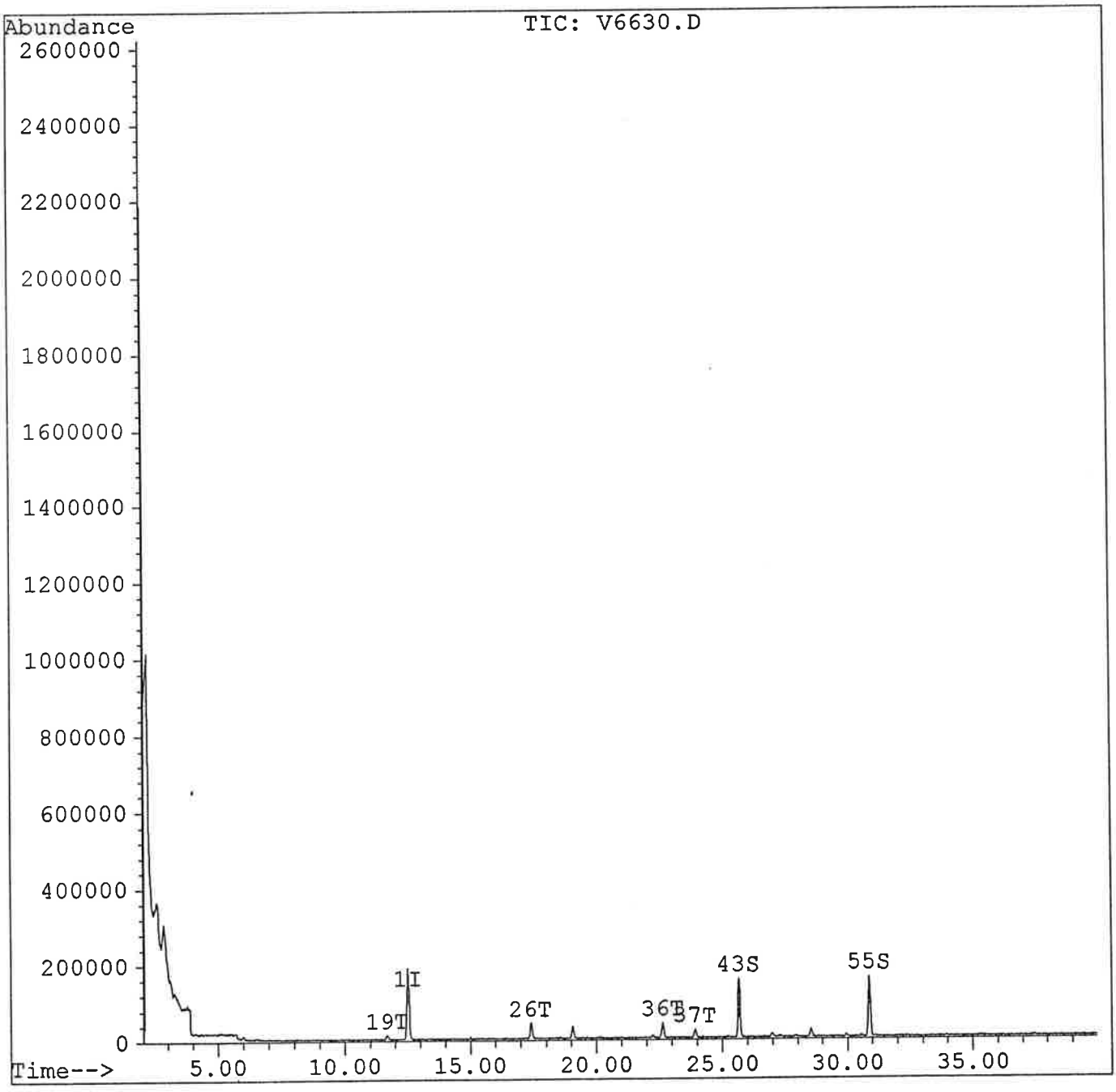
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6630.D
Acq On : 21 Oct 99 5:27 pm
Sample : R-6204.5
Misc : Lyondell - RC-EC-69-1099
Quant Time: Oct 22 11:33 1999

Vial: 14
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration



Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6631.D
Acq On : 21 Oct 99 6:14 pm
Sample : R-6204.6
Misc : Lyondell - RC-EC-33-1099
Quant Time: Oct 22 11:31 1999

Vial: 15
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration

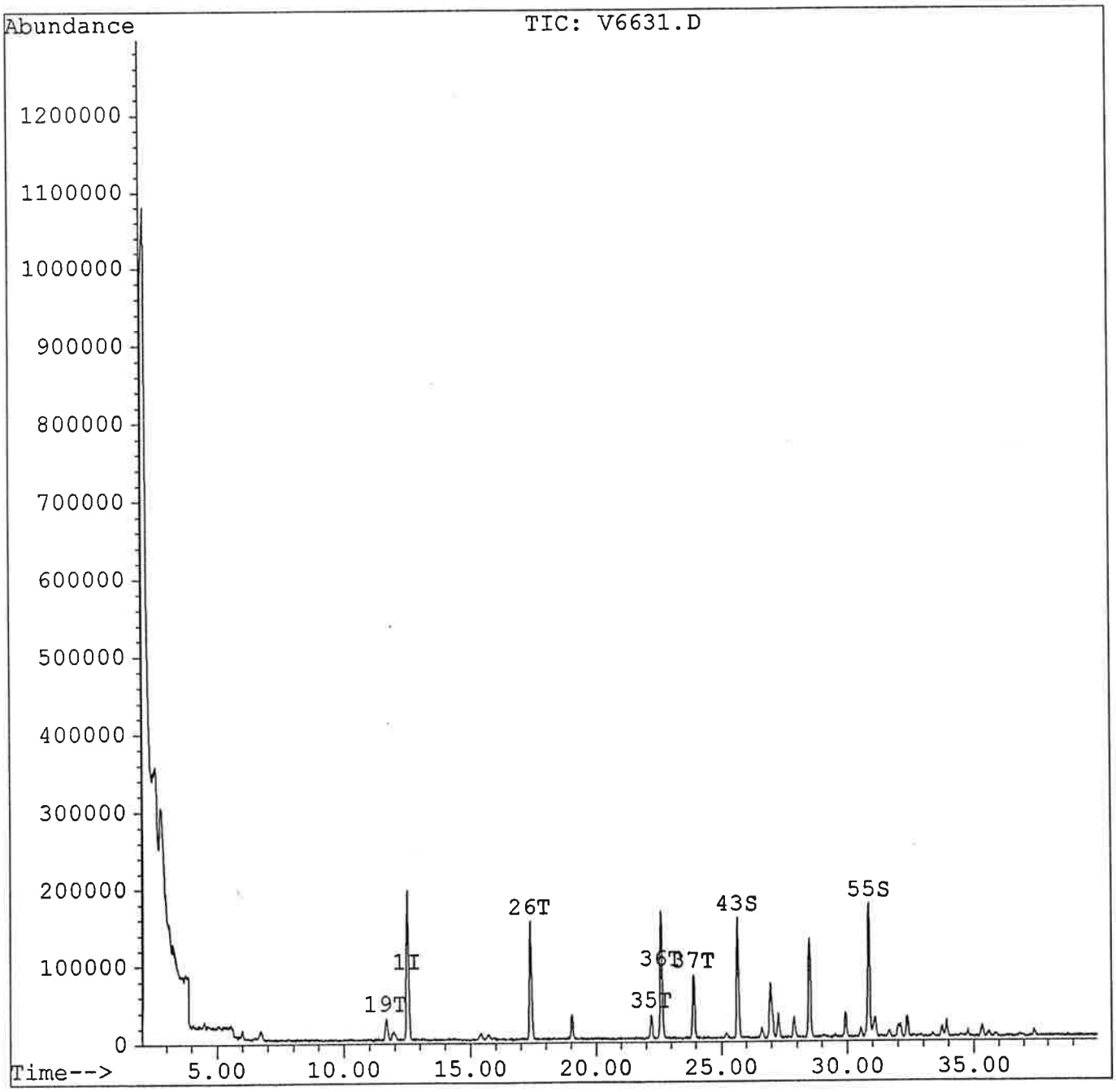
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	12.51	96	512975	5.00	ug/L	-0.02
System Monitoring Compounds						%Recovery
43) 4-bromofluorobenzene	25.65	95	198194	5.14	ug/L	102.79%
55) 1,2-dichlorobenzene-d4	30.87	152	131175	5.28	ug/L	105.58%
Target Compounds						Qvalue
19) Benzene	11.67	78	79680	0.42	ug/L	94
26) Toluene	17.40	91	351516	2.18	ug/L	96
35) Ethylbenzene	22.22	91	77328	0.43	ug/L	95
36) m&p-xylenes	22.63	106	147430	1.19	ug/L	97
37) o-xylene	23.91	91	168235	1.35	ug/L	97

(#) = qualifier out of range (m) = manual integration

Data File : C:\HPCHEM\1\DATA\V6631.D
Acq On : 21 Oct 99 6:14 pm
Sample : R-6204.6
Misc : Lyondell - RC-EC-33-1099
Quant Time: Oct 22 11:31 1999

Vial: 15
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration



017

Quant. .ation Report

Data File : C:\HPCHEM\1\DATA\V6632.D
Acq On : 21 Oct 99 7:00 pm
Sample : R-6204.7
Misc : Lyondell - RC-EC-00-1099
Quant Time: Oct 22 11:29 1999

Vial: 16
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	12.52	96	530075	5.00	ug/L	-0.01
System Monitoring Compounds						%Recovery
43) 4-bromofluorobenzene	25.67	95	198142	4.97	ug/L	99.44%
55) 1,2-dichlorobenzene-d4	30.87	152	131666	5.13	ug/L	102.56%
Target Compounds						Qvalue
19) Benzene	11.67	78	84522	0.43	ug/L	98
26) Toluene	17.39	91	414768	2.49	ug/L	94
35) Ethylbenzene	22.21	91	88610	0.48	ug/L	89
36) m&p-xylenes	22.64	106	186555	1.46	ug/L	98
37) o-xylene	23.92	91	211986	1.65	ug/L	98

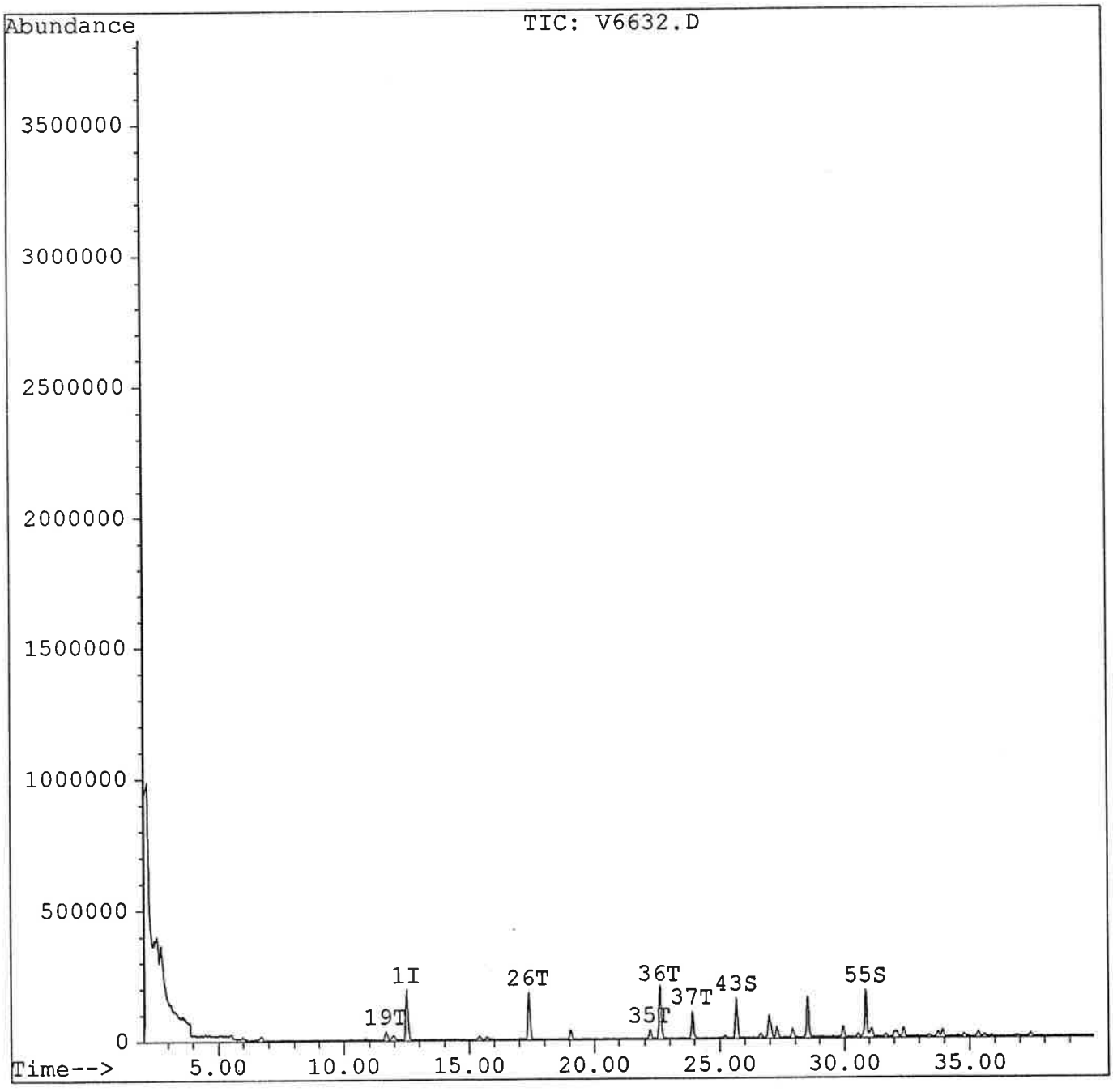
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6632.D
Acq On : 21 Oct 99 7:00 pm
Sample : R-6204.7
Misc : Lyondell - RC-EC-00-1099
Quant Time: Oct 22 11:29 1999

Vial: 16
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration



Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6626.D
Acq On : 21 Oct 99 2:21 pm
Sample : R-6204.8
Misc : Lyondell - RC-EL-00-1099A
Quant Time: Oct 22 11:39 1999

Vial: 10
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration

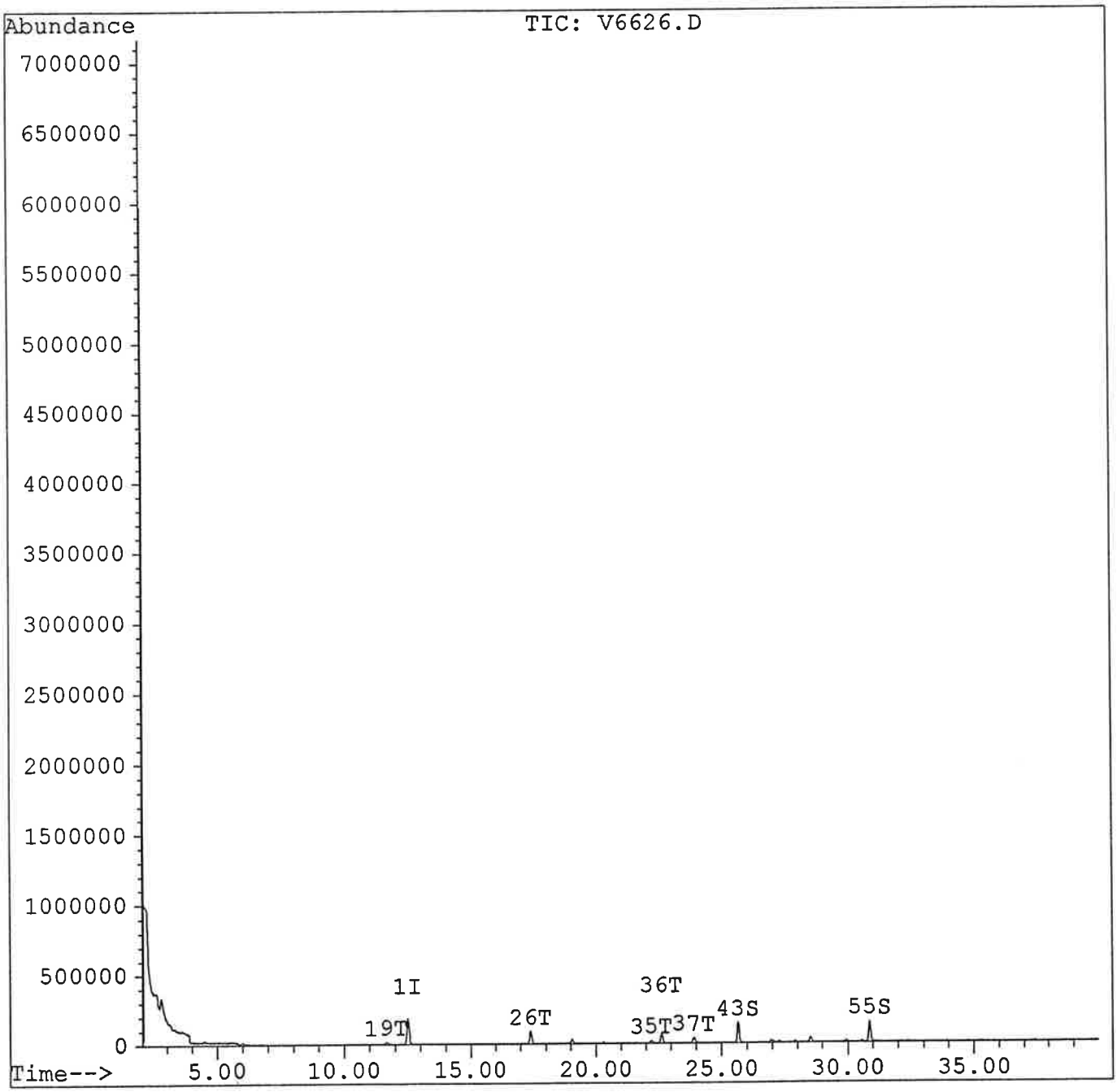
Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene	12.51	96	489543	5.00 ug/L	-0.02
System Monitoring Compounds					%Recovery
43) 4-bromofluorobenzene	25.68	95	181678	4.94 ug/L	98.73%
55) 1,2-dichlorobenzene-d4	30.87	152	120257	5.07 ug/L	101.43%
Target Compounds					Qvalue
19) Benzene	11.67	78	38311	0.21 ug/L	97
26) Toluene	17.41	91	194136	1.26 ug/L	98
35) Ethylbenzene	22.23	91	43586	0.25 ug/L	98
36) m&p-xylenes	22.65	106	61715	0.52 ug/L	91
37) o-xylene	23.92	91	75764	0.64 ug/L	97

(#) = qualifier out of range (m) = manual integration
V6626.D RUN524.M Fri Oct 22 11:39:31 1999

Data File : C:\HPCHEM\1\DATA\V6626.D
Acq On : 21 Oct 99 2:21 pm
Sample : R-6204.8
Misc : Lyondell - RC-EL-00-1099A
Quant Time: Oct 22 11:39 1999

Vial: 10
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration



021

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6634.D
Acq On : 21 Oct 99 8:32 pm
Sample : R-6204.9
Misc : Lyondell - Rinsate Blank
Quant Time: Oct 22 9:10 1999

Vial: 4
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration

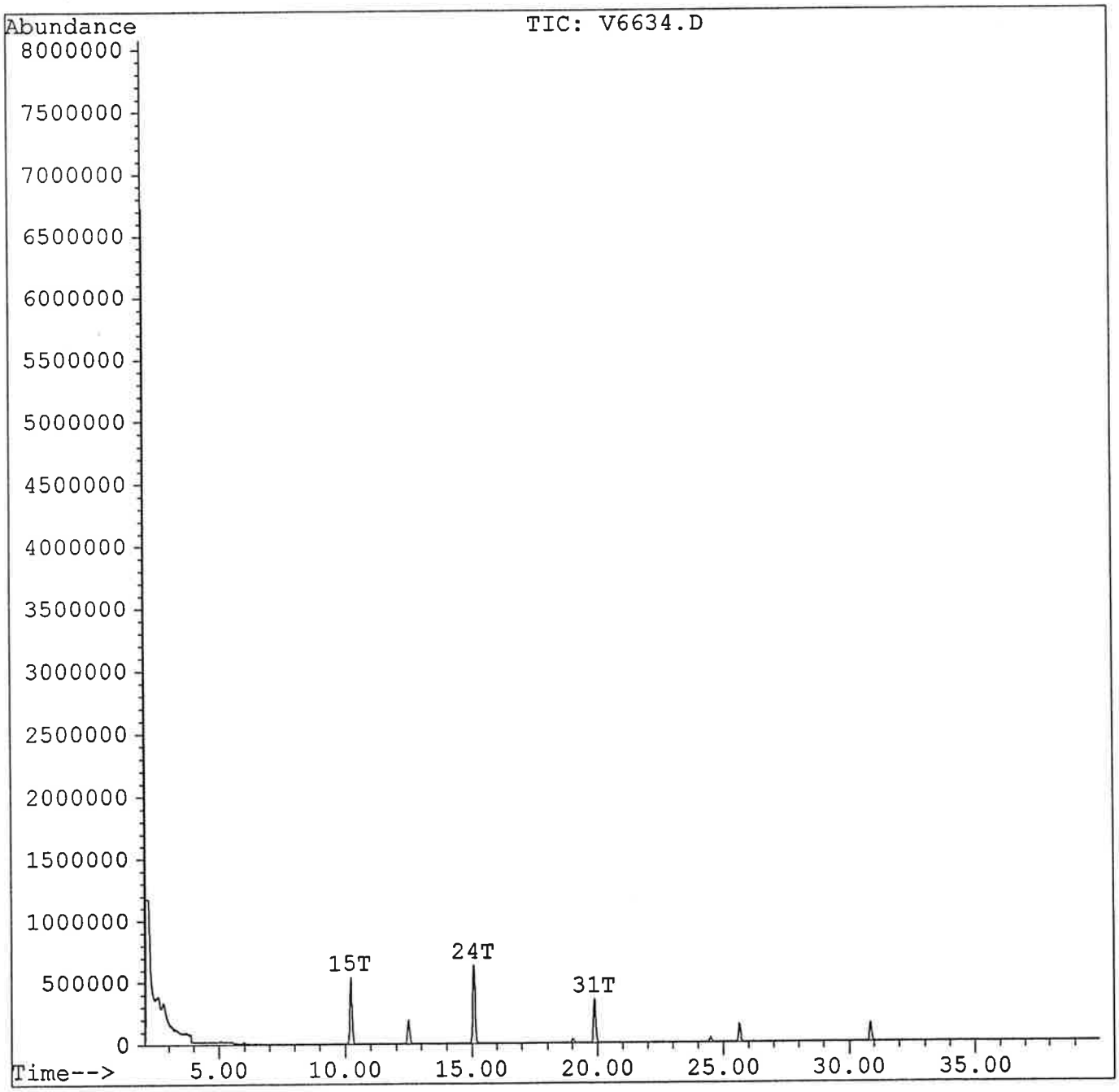
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	12.50	96	496550	5.00	ug/L	-0.03
System Monitoring Compounds						%Recovery
43) 4-bromofluorobenzene	25.64	95	186984	5.01	ug/L	100.18%
55) 1,2-dichlorobenzene-d4	30.85	152	122328	5.09	ug/L	101.72%
Target Compounds						Qvalue
15) Chloroform	10.22	83	1336164	15.93	ug/L	99
24) Bromodichloromethane	15.08	83	1277969	27.70	ug/L	98
31) Dibromochloromethane	19.89	129	577469	28.53	ug/L	99

(#) = qualifier out of range (m) = manual integration

Data File : C:\HPCHEM\1\DATA\V6634.D
Acq On : 21 Oct 99 8:32 pm
Sample : R-6204.9
Misc : Lyondell - Rinsate Blank
Quant Time: Oct 22 9:10 1999

Vial: 4
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration



023

Quantitation Report

Data File : c:\hpchem\1\data\v6635.d
Acq On : 21 Oct 99 9:19 pm
Sample : R-6204.10
Misc : Lyondell - Trip Blank
Quant Time: Oct 22 9:10 1999

Vial: 5
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	12.50	96	449348	5.00	ug/L	-0.03
System Monitoring Compounds						%Recovery
43) 4-bromofluorobenzene	25.62	95	175205	5.19	ug/L	103.73%
55) 1,2-dichlorobenzene-d4	30.80	152	113226	5.20	ug/L	104.04%
Target Compounds						Qvalue

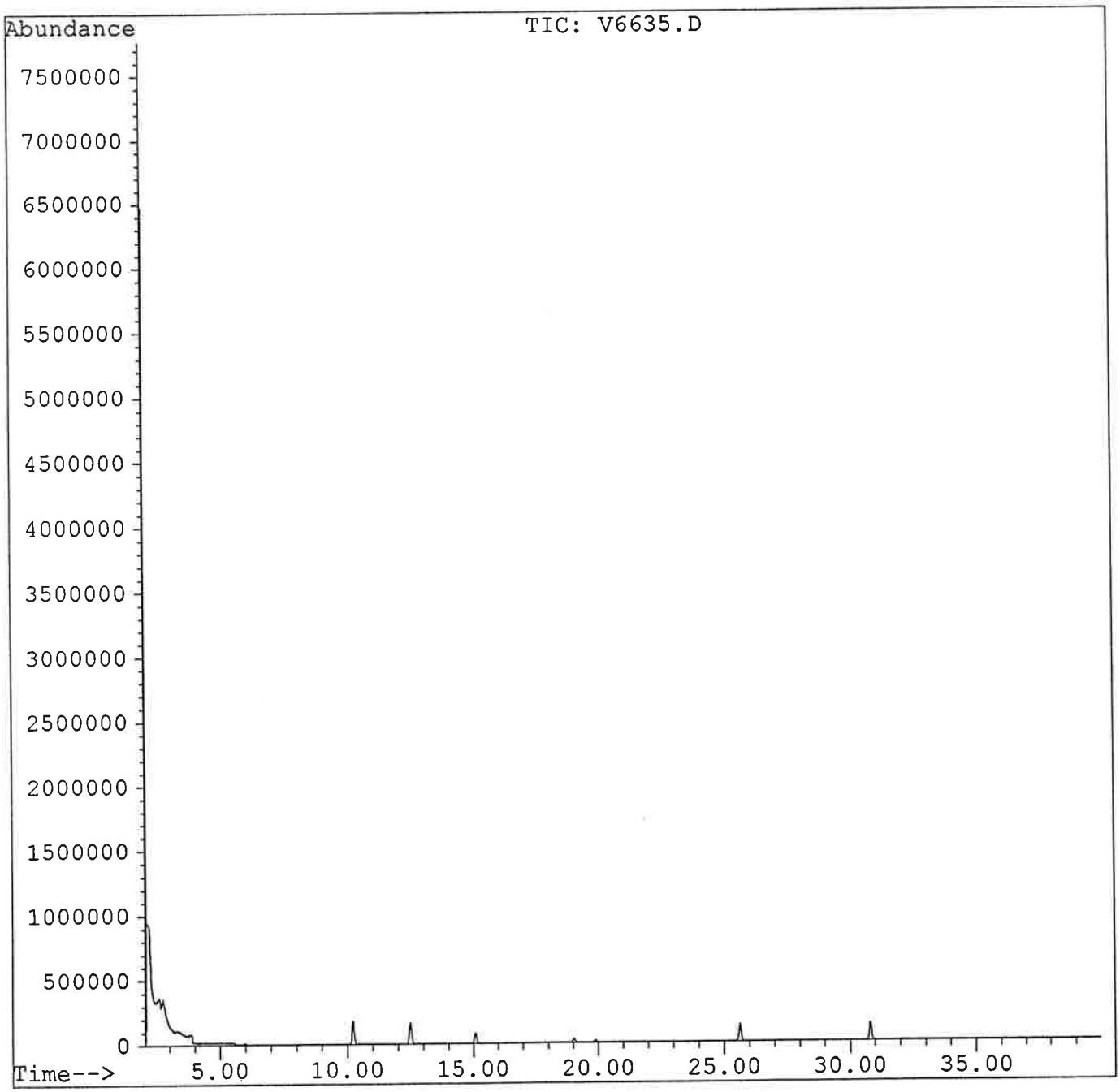
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : c:\hpchem\1\data\v6635.d
Acq On : 21 Oct 99 9:19 pm
Sample : R-6204.10
Misc : Lyondell - Trip Blank
Quant Time: Oct 22 9:10 1999

Vial: 5
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration



025

RELIANCE LABORATORIES, INC.

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Customer : Lyondel

	SAMPLE NO.	SMC1 #	SMC2 #	#	OTHER #	TOT OUT
01	VBLK01	108				
02	R-6204.8	99				
03	R-6204.2	103				
04	R-6204.3	98				
05	R-6204.4	101				
06	R-6204.5	102				
07	R-6204.6	103				
08	R-6204.7	99				
09	R-6204.1	100				
10	R-6204.9	100				
11	R-6204.10	104				
12	VBLK02	93				
13	R-6204.6MS	96				
14	R-6204.6MSD	99				
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

QC LIMITS
(75-115)
(75-115)

SMC1 = 4-Bromofluorobenzene
SMC2 = 1,2-dichlorobenzene-d4

\# Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM II VOA-1

RELIANCE LABORATORIES, INC.

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Matrix Spike - Sample No.: R-6204.6

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
Benzene	3.00	0.21	3.27	102	(80-120)
Toluene	3.00	1.09	4.05	99	(80-120)
Ethylbenzene	3.00	0.22	3.32	103	(80-120)
m&p-xylenes	3.00	0.59	3.77	106	(80-120)
o-xylenes	3.00	0.68	3.80	104	(80-120)
Styrene	3.00	0.00	3.06	102	(80-120)

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzene	3.00	3.15	98	4	20	(80-120)
Toluene	3.00	3.96	97	2	20	(80-120)
Ethylbenzene	3.00	3.18	99	5	20	(80-120)
m&p-xylenes	3.00	3.58	100	6	20	(80-120)
o-xylenes	3.00	3.69	100	4	20	(80-120)
Styrene	3.00	2.83	94	8	20	(80-120)

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Comments: _____

_____

RELIANCE LABORATORIES, INC.

VOLATILE METHOD BLANK SUMMARY

VBLK0

Customer : Lyondel

Lab File ID V6625.D

Lab Sample ID: BLANK1

Date Analyzed: 10/21/99

Time Analyzed: 1334

GC Column: DB-624 ID: 0.53 (mm)

Instrument ID: HP5971

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	R-6204.8	EL00A	V6626.D	1421
02	R-6204.2	ER00	V6627.D	1508
03	R-6204.3	EL19	V6628.D	1554
04	R-6204.4	EL00	V6629.D	1641
05	R-6204.5	EC69	V6630.D	1727
06	R-6204.6	EC33	V6631.D	1814
07	R-6204.7	EC00	V6632.D	1900
08	R-6204.1	ER65	V6633.D	1946
09	R-6204.9	RBLK	V6634.D	2032
10	R-6204.10	TBLK	V6635.D	2119
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
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COMMENTS:

FORM IV VOA

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6625.D
Acq On : 21 Oct 99 1:34 pm
Sample : VBLK01
Misc : Method Blank
Quant Time: Oct 22 11:40 1999

Vial: 9
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene	12.52	96	515565	5.00 ug/L	0.00
System Monitoring Compounds					%Recovery
43) 4-bromofluorobenzene	25.67	95	209884	5.42 ug/L	108.30%
55) 1,2-dichlorobenzene-d4	30.87	152	141082	5.65 ug/L	112.98%
Target Compounds					Qvalue

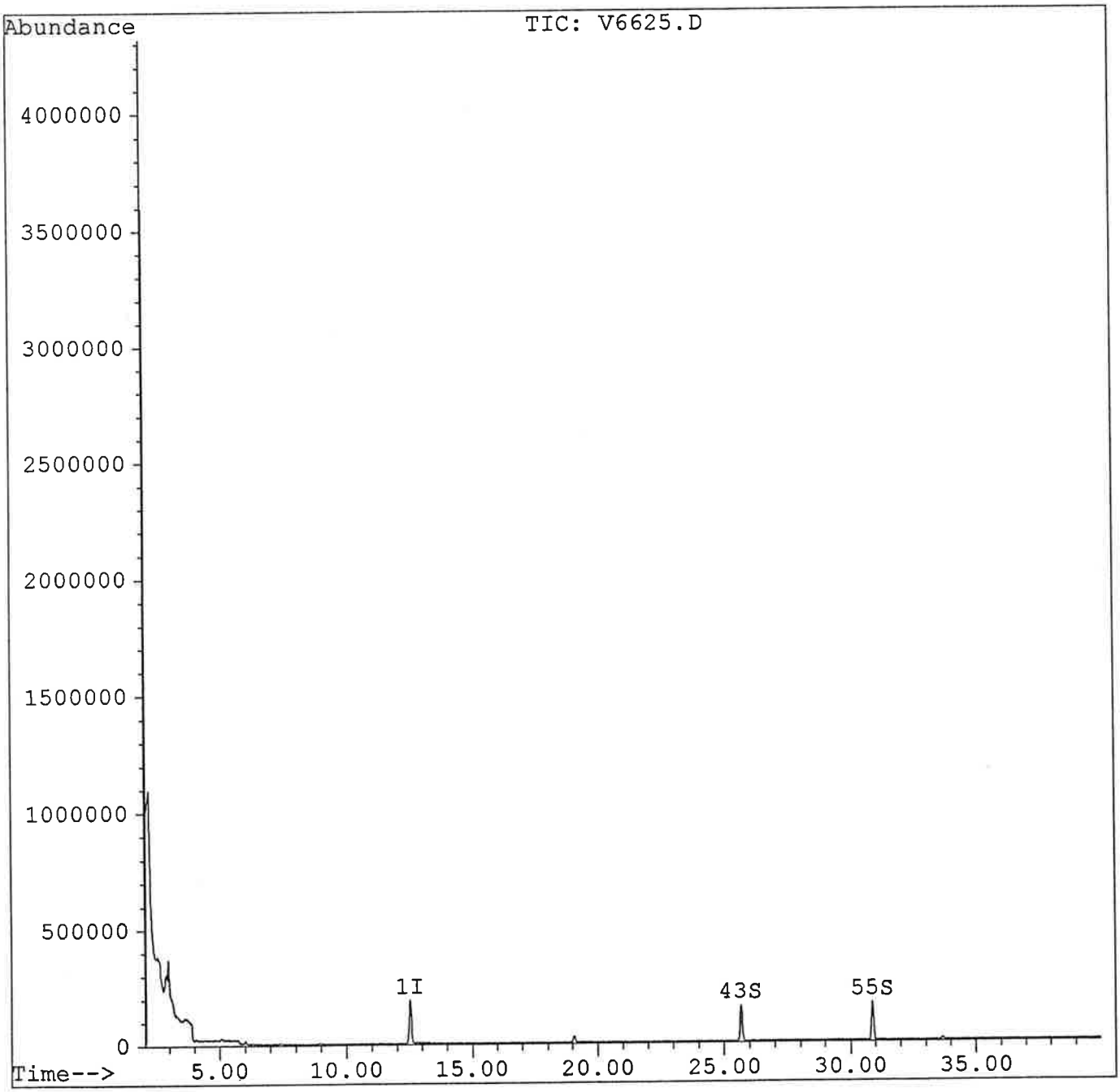
(#) = qualifier out of range (m) = manual integration
V6625.D RUN524.M Fri Oct 22 11:40:15 1999

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6625.D
Acq On : 21 Oct 99 1:34 pm
Sample : VBLK01
Misc : Method Blank
Quant Time: Oct 22 11:40 1999

Vial: 9
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration



030

RELIANCE LABORATORIES, INC.

VOLATILE METHOD BLANK SUMMARY

VBLK0

Customer : Londel

Lab File ID V6638.D

Lab Sample ID: BLANK2

Date Analyzed: 10/22/99

Time Analyzed: 1602

GC Column: DB-624 ID: 0.53 (mm)

Instrument ID: HP5971

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	R-6204.6MS	EC33MS	V6639.D	1650
02	R-6204.6MSD	EC33MSD	V6640.D	1737
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
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21				
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24				
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27				
28				
29				
30				

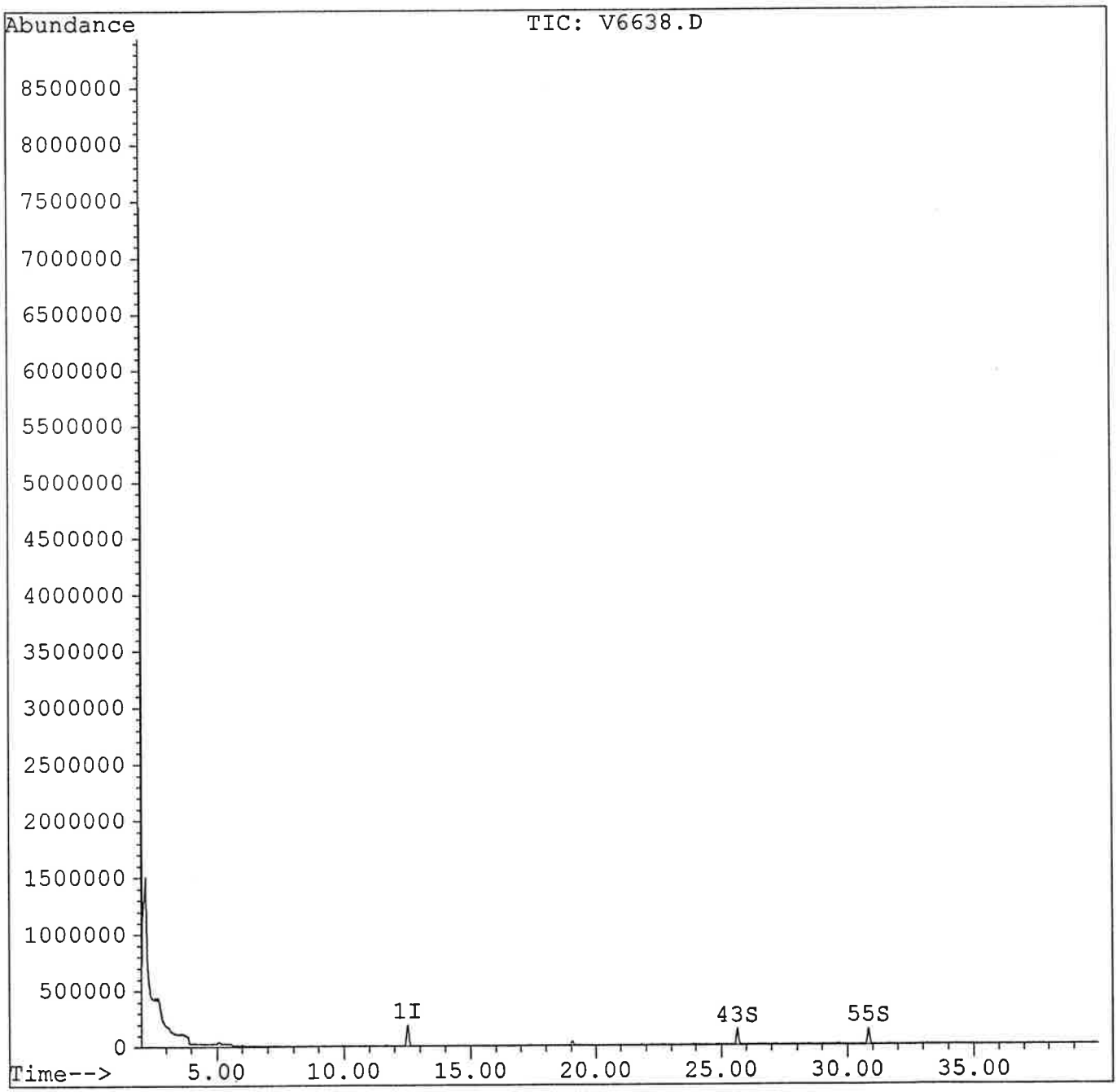
COMMENTS:

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6638.D
Acq On : 22 Oct 99 4:02 pm
Sample : Method Blank
Misc : Method Blank
Quant Time: Oct 27 9:48 1999

Vial: 9
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Thu Oct 21 13:22:11 1999
Response via : Multiple Level Calibration



RELIANCE LABORATORIES, INC.

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Customer : Lyondel

Lab File ID: V6621.D

BFB Injection Date: 10/21/99

Instrument ID: HP5971A

BFB Injection Time: 0945

GC Column: DB-624 ID: 0.53 (mm)

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	22.2
75	30.0 - 66.0% of mass 95	47.4
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.7
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	65.1
175	4.0 - 9.0% of mass 174	5.2 (8.0)1
176	93.0 - 101.0% of mass 174	62.4 (96.0)1
177	5.0 - 9.0% of mass 176	3.8 (6.1)2

1-Value is % mass 174 2-Value is % mass 176

This check applies to the following SAMPLES, MS, MSD, BLANKS and STANDARDS:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	ICC005	V6622.D	10/21/99	1033
02	VSTD020	ICC002	V6623.D	10/21/99	1120
03	VSTD010	ICC001	V6624.D	10/21/99	1217
04	VBLK01	BLANK1	V6625.D	10/21/99	1334
05	R-6204.8	EL00A	V6626.D	10/21/99	1421
06	R-6204.2	ER00	V6627.D	10/21/99	1508
07	R-6204.3	EL19	V6628.D	10/21/99	1554
08	R-6204.4	EL00	V6629.D	10/21/99	1641
09	R-6204.5	EC69	V6630.D	10/21/99	1727
10	R-6204.6	EC33	V6631.D	10/21/99	1814
11	R-6204.7	EC00	V6632.D	10/21/99	1900
12	R-6204.1	ER65	V6633.D	10/21/99	1946
13	R-6204.9	RBLK	V6634.D	10/21/99	2032
14	R-6204.10	TBLK	V6635.D	10/21/99	2119
15					
16					
17					
18					
19					
20					
21					
22					

FORM V VOA

RELIANCE LABORATORIES, INC.

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Customer : Lyondel

Lab File ID: V6636.D

BFB Injection Date: 10/22/99

Instrument ID: HP5971A

BFB Injection Time: 1438

GC Column: DB-624 ID: 0.53 (mm)

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	22.0
75	30.0 - 66.0% of mass 95	45.1
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	63.7
175	4.0 - 9.0% of mass 174	4.7 (7.4)1
176	93.0 - 101.0% of mass 174	63.8 (100.3)1
177	5.0 - 9.0% of mass 176	4.4 (6.8)2

1-Value is % mass 174 2-Value is % mass 176

This check applies to the following SAMPLES, MS, MSD, BLANKS and STANDARDS:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	CC002	V6637.D	10/22/99	1510
02	VBLK02	BLANK2	V6638.D	10/22/99	1602
03	R-6204.6MS	EC33MS	V6639.D	10/22/99	1650
04	R-6204.6MSD	EC33MSD	V6640.D	10/22/99	1737
05					
06					
07					
08					
09					
10					
11					
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20					
21					
22					

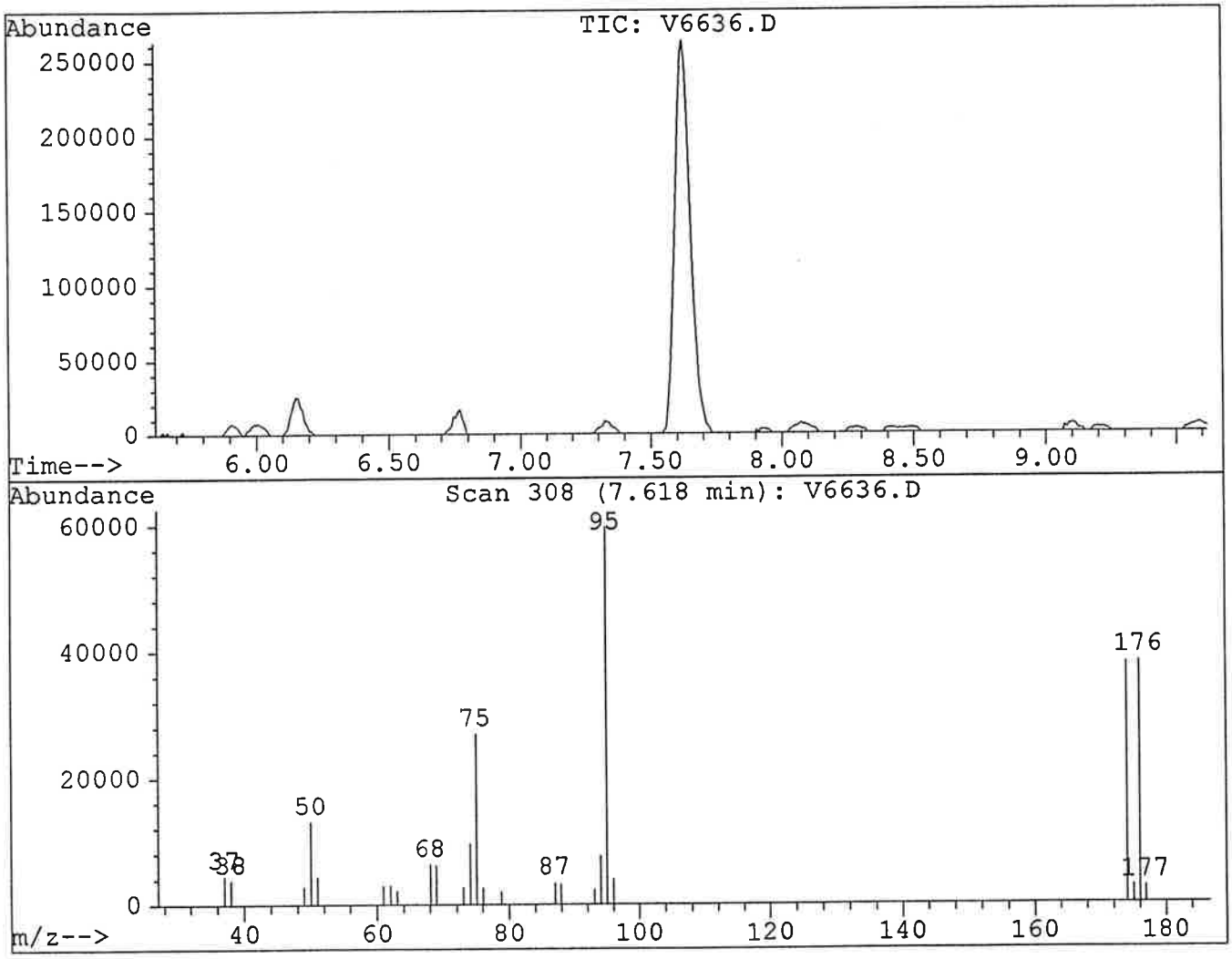
FORM V VOA

BFB

Data File : C:\HPCHEM\1\DATA\V6636.D
Acq On : 22 Oct 99 2:38 pm
Sample : bfb
Misc : bfb

Vial: 1
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics



Peak Apex is scan: 308

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	22.0	13105	PASS
75	95	30	80	45.1	26944	PASS
95	95	100	100	100.0	59680	PASS
96	95	5	9	6.5	3901	PASS
173	174	0	2	0.0	0	PASS
174	95	50	100	63.7	37992	PASS
175	174	5	9	7.4	2805	PASS
176	174	95	101	100.3	38096	PASS
177	176	5	9	6.8	2607	PASS

V6636.D RUN524.M Wed Oct 27 09:45:40 1999

RELIANCE LABORATORIES, INC.

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Customer Lyondel

Instrument ID: HP5971A

Calibration Date(s): 10/21/99 10/21/99

Calibration Times: 1033 1217

GC Column: DB-624 ID: 0.53 (mm)

Lab File ID: RRF01 = V6624.D RRF02 = V6623.D
RRF05 = V6622.D

COMPOUND	RRF01	RRF02	RRF05			$\overline{RRF}$	% RSD
Benzene	1.803	1.783	1.923			1.836	4.1
Toluene	1.443	1.620	1.646			1.570	7.0
Ethylbenzene	1.534	1.869	1.859			1.754	10.9
m&p-xylenes	1.039	1.294	1.285			1.206	12.0
o-xylene	1.073	1.269	1.299			1.214	10.1
Styrene	0.746	0.891	0.930			0.856	11.3
4-bromofluorobenzene	0.371	0.387	0.370			0.376	2.5
1,2-dichlorobenzene-d4	0.241	0.241	0.245			0.242	1.0

Page 1 of 1

FORM VI VOA

RELIANCE LABORATORIES, INC.

VOLATILE CONTINUING CALIBRATION CHECK

Customer : Lyondell

Instrument ID: HP5971A Calibration Date: 10/22/99 Time: 1225

Lab File ID: V6298.D Init. Calib. Date(s): 10/21/99 10/21/99

Init. Calib. Times: 1033 1217

GC Column: DB-624 ID: 0.53 (mm)

COMPOUND	$\overline{RRF}$	RRF20	MIN RRF	%D	MAX %D
Benzene	1.837	1.875		-2.1	
Toluene	1.570	1.647		-4.9	
Ethylbenzene	1.754	1.834		-4.6	
m&p-xylenes	1.206	1.266		-5.0	
o-xylene	1.213	1.279		-5.4	
Styrene	0.856	0.883		-3.2	
4-Bromofluorobenzene	0.376	0.390		-3.7	
1,2-dichlorobenzene-d4	0.242	0.257		3.5	

All other compounds must meet a minimum RRF of 0.010.

FORM VII VOA

RELIANCE LABORATORIES, INC.

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Customer : Lyondel

Lab File ID (Standard): V6622.D

Date Analyzed: 10/21/99

Instrument ID: HP5971A

Time Analyzed: 1033

GC Column: DB-624 ID: 0.53 (mm)

		IS1 AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	561288	12.53				
	UPPER LIMIT	1122576	13.03				
	LOWER LIMIT	280644	12.03				
	SAMPLE NO.						
01	VBLK01	515565	12.52				
02	R-6204.8	489543	12.51				
03	R-6204.2	487047	12.52				
04	R-6204.3	473211	12.52				
05	R-6204.4	524441	12.52				
06	R-6204.5	499715	12.53				
07	R-6204.6	512975	12.51				
08	R-6204.7	530075	12.52				
09	R-6204.1	506914	12.49				
10	R-6204.9	496550	12.50				
11	R-6204.10	449348	12.50				
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 = Fluorobenzene

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk
* Values outside of QC limits.

FORM VIII VOA

CHAIN OF CUSTODY

Customer: Lyondell Chemical
Address: 400 Frankfort Rd Monaca Pa. 15061
Phone (724) 728 - 6586
Fax: (724) 728 - 6498
E-Mail: b.petroff@worldnet.att.net

Applied Hydrology Associates, Inc.
400 Frankfort Rd, Monaca, Pa 15061

Date: 10/21/99
LAB ID: R-6204
Project ID: _____
Trun around time Standard
(stanrard / rush)
Fax results: (Y) N
E-Mail results: (Y) N

Sampler Name: BDP
Preserved Y (N)
Sample Intact: (Y) N

Sample ID	Date Spld.	Time Spld	# of containers	MATRIX: Water	MATRIX: Soil	MATRIX: Other	ORGANICS: EPA Test Method 524.2	ORGANICS: BTEX (602/8020)	ORGANICS: TPH (418.1)	ORGANICS: VOA (624/8260) + 15	ORGANICS: BNA / BN / + 15	ORGANICS: Pest / Herb	ORGANICS: PCB's	ORGANICS: TCLP Organics / pp + 40	ORGANICS: Other	METALS: TCLP / RCRA (8)	METALS: Priority Pol. (13)	METALS: Total Metals (list below)	METALS: Dissolved Metals	METALS: Other	OTHERS: pH / CN / Sulfide	OTHERS: Fl pt / % Solids	OTHERS: O & G / TSS / TOX	OTHERS: BOD / COD / TOC	OTHERS	OTHERS	Notes:
RC-ER-65-1099	10/20/99	11:02	1	x			x																				
RC-ER-00-1099	10/20/99	11:03	1	x			x																				
RC-EL-19-1099	10/20/99	10:47	1	x			x																				
RC-EL-00 -1099	10/20/99	10:52	1	x			x																				
RC-EC-69-1099	10/20/99	10:56	1	x			x																				
RC-EC-33-1099	10/20/99	10:57	1	x			x																				
RC-EC-00-1099	10/20/99	10:58	1	x			x																				
RC-EL-00-1099A	10/20/99	10:52	1	x			x																				
Rinsate Blank	10/20/99	11:35	1	x			x																				
Trip Blank	10/20/99	9:45	1	x			x																				

Instructions: Please Fax results to and Skip Meier: (303) 873 - 6110 and E-Mail results to Brian Petroff: b.petroff@worldnet.att.net.

Submitted by: BDP
Agent of: AHA
Received by: [signature]
Agent of: Priority
Date / Time: 10/21/99 9AM

Submitted by: _____
Agent of: _____
Received by: _____
Agent of: _____
Date / Time: _____

Submitted by: _____
Agent of: _____
Received by: _____
Agent of: _____
Date / Time: _____

Report to: _____
Dellverables:
- [ ] Standard
- [ ] Reduced
- [ ] Customized

AHA File name:
Chain of Custody for Raccoon Creek

10/20/993:40 PM